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THE
ONTARIO WATER RESOURCES
COMMISSION

REPORT ON

WATER POLLUTION SURVEY

TOWNSHIP OF ESSA

COUNTY OF SIMCOE

1964

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TOWNSHIP OF ESSA - 1964
COUNTY OF SIMCOE

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Report on water pollution
survey, township of Essa,
county of Simcoe.

80889

Report on

WATER POLLUTION SURVEY

T O W N S H I P O F E S S A

County of Simcoe

March 1964

The Division of Sanitary Engineering

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INTRODUCTION

A study was made of the Township of Essa area in connection with a survey to assess the sanitary conditions of local watercourses.

Surveys of this type are made by the Ontario Water Resources Commission and are designed to locate and record any existing and potential sources of pollution.

Recommendations are made with respect to pollution abatement and prevention. When water and sewage treatment works appear desirable, the Commission has a programme to aid in the construction and financing of these works.

GENERAL INFORMATION

The Township of Essa with a population of approximately 5,657, excluding the military personnel stationed at Camp Borden, is bounded on the north, east and south by Highway Nos. 90, 27, and 89 respectively.

The township is essentially an agriculture area with part of Camp Borden occupying the north-west corner of the municipality.

The municipal offices are located in the Community of Baxter.

There are four water works in Essa which are listed as follows:

<u>Systems</u>	<u>Sources</u>
1. Camp Borden Water Works	4 wells
2. R.C.A.F. 13X Detachment Water Works	well
3. McGeorge Water Works	
(i) Police Village of Angus	well
(ii) East of Angus	well
4. Hillcrest Subdivision Water Works	well

With the exception of the sewage from the military camp and air force station at Camp Borden, domestic sewage in the remainder of the township is generally disposed of by means of private septic tank systems. The facilities serving the national defence bases are described later in this report.

The installation of private sewage systems is inspected by the staff of the Simcoe County Health Unit, but inspections with respect to plumbing have not commenced to date.

SEWAGE TREATMENT PLANTS

1. Camp Borden Sewage Treatment Plant(S.T.P.)

The sewage from the military base at Camp Borden receives primary treatment at a plant located near the north barrier.

Briefly, the details of the plant are described as follows:

Design Capacity of Plant (consisting of primary clarifier & 2 digesters) approximately	gpd	4,500,000
Treatment	grit removal, screening, sedimentation, 2-stage sludge digestion, pre-and post-chlorination	
Receiving Stream	Pine River (tributary of Nottawasaga River)	

Flow Treatment Data - 1963

Average Daily Flow	gpd	858,000 *
Average 5-day BOD of Final Effluent	ppm	53 **
Average Suspended Solids of Final Effluent	ppm	42 **
Average BOD Reduction	%	37 ***
Average Suspended Solids Removal	%	64****

* This figure is based on the approximate flows for the months of March, April, May and June 1963.

** This figure is based on 8 sets of samples collected in 1963.

*** This figure is based on the analyses of 5 samples. The BOD of one sample actually increased from 32 ppm in the raw sewage to 75 ppm in the final effluent indicating deterioration of the sewage through the treatment units.

**** This figure is based on the analyses of 6 samples.

Comments

The efficiencies of removal for a primary treatment plant such as under discussion are expected to be 35 per cent removal of BOD and 60-65 per cent suspended solids. The average removal efficiencies of the Camp Borden sewage treatment plant based on the sample results of 1963 were 37 and 64 per cent removal of BOD and suspended solids respectively.

While the treatment efficiency is within the acceptable limits for this type of plant, the biochemical oxygen demand and suspended solids contents of the final effluent are considerably higher than the Commission's objective concentration limits of not greater than 15 ppm.

2. R.C.A.F. 13X Munitions Detachment S.T.P.

This plant serves the R.C.A.F. 13X Munitions Detachment located near the Police Village of Angus.

The wastes are screened, receive septic tank treatment and are discharged to a tile bed. The latter is provided with an underdrained system which is connected to a drainage ditch.

Under normal conditions, there is little or no discharge from the tile bed underdrain.

Comments

Since there was no evidence during past inspections that the final effluent in the ditch was advancing to reach a watercourse, this plant is not expected to become a source of water pollution.

DRAINAGE

Drainage for the township lands is provided by the Nottawasaga River and its tributaries, Mad River, Bear Creek, Pine River, Innisfil Creek and Boyne River.

REFUSE DISPOSAL

There are three municipal refuse disposal sites available in the township but no garbage collection service is provided. The sites are described as follows:

1. Baxter Site

This dump is situated on the east side of the 5th Line approximately 0.8 miles south of the Community of Baxter.

It is open to township residents on Wednesdays. Garbage and refuse are dumped over the banks of a natural depression. Drainage from the latter is tributary to the Nottawasaga River.

Comments

Seepage from the area in question was discharging into the Nottawasaga River at the time of the inspection on March 6, 1964. This seepage may have been due to surface run-off.

It is proposed that this dump be re-examined at a later date to re-assess its location with respect to pollution.

2. Angus Site

A dumping ground is available on the east side of the 3rd Line approximately 0.4 miles south of the Police Village of Angus. It is open to the public on Fridays and Saturdays.

The garbage is dumped on the ground surface, and the combustible material is incinerated.

Comments

Due to the sandy soil and drainage conditions in the vicinity of the dumping grounds, this site is not expected to become a source of water pollution.

3. Ivy Site

The third site is located at the intersection of the 9th Line and Side Road No.25 approximately 2.0 miles north of the Hamlet of Ivy. It is open for public use on Mondays.

The garbage is dumped into a gully.

Comments

There was no evidence of any drainage from the gully at the time of the examination.

FISH KILL IN NOTTAWASAGA RIVER

In July 1963, hundreds of dead fish were found in the Nottawasaga River immediately downstream from the town line(Hwy.No.89) separating the Townships of Essa and Tecumseth.

At the time, water was being pumped from the river at a number of points by local farmers, mixed with a fungicide and D.D.T. along the river bank, and then sprayed on nearby potato crops. One of the water intake points was located in the Township of Essa immediately downstream from Highway No.89.

The investigation revealed that a toxic agent, probably D.D.T., had been discharged into the river and this evidently caused the fish kill.

Comments

In future, if spray tanks are to be filled in this manner using a toxic agent, greater precautions will be required to avoid a poisonous substance or solution from entering the water.

ANALYSES OF SAMPLES

The laboratory results of bacteriological examinations and chemical analyses of samples collected from the watercourses providing drainage for the Township of Essa are included in Table I which is appended to this report.

All of the examinations and analyses were performed at the Ontario Water Resources Commission laboratory in Toronto.

A plan of the township showing the approximate location of the sampling points and other pertinent information is enclosed at the back of this report.

1. Significance of Laboratory Results

The OWRC objectives for surface waters in Ontario are as follows:

5-day Biochemical Oxygen Demand(BOD)
not greater than 4 ppm

Membrane Filter(MF) Coliform Count
not greater than 2400 coliforms
per 100 ml

Comments

The sanitary chemical quality of 50 per cent of the samples collected from Spring Creek at sampling point designated as NBS-50.7 was unsatisfactory. These samples were obtained 1.2 miles downstream from a waste stabilization lagoon which receives waste from a large food processing industry located in the Town of Alliston.

Equipment to increase the efficiency of the treatment provided by this lagoon was recently installed, and it is expected that an improvement in the quality of the water in this stream will result.

Attention is drawn to the excessive bacterial counts in the samples collected from the Boyne River. Sources of pollution originating in Alliston, particularly the sewage treatment plant, are evidently responsible for these adverse results. The Commission is endeavouring to have more effective treatment provided at the Alliston plant. It is understood that the town is considering certain improvements to the sewage works which will no doubt result in a better quality of water in the Boyne River downstream from Alliston.

POLICE VILLAGE OF ANGUS

Sewage disposal throughout the Police Village of Angus is by means of individual septic tank systems. Difficulties in the operation of some of these systems are experienced at times despite the sandy soil conditions. The majority of the problems occur in the older section of the village where small building lots exist.

In general, water is obtained from private sand point wells. Most of the wells are shallow, and while an adequate supply of water is normally available, periodic shortages have been reported.

A number of meetings have been held with the officials and citizens of Angus to discuss a proposed installation of water works and sewage works to serve this area.

A preliminary report on a sewage works and a water works to serve Angus was prepared by W.D.Beckett, Consulting Engineer, in 1962. The report was later revised to include the treatment of sewage from a proposed local subdivision.

The results of a referendum held in November 1963, showed preference for a sewage works in Angus prior to the installation of a water works.

The Commission is awaiting additional information from the consulting engineer regarding the design features of the proposed sewage and water works.

SUMMARY

During the early part of March 1963, a study was made in the Township of Essa in connection with a survey of pollution conditions of the local watercourses. With the exception of the Camp Borden sewage treatment plant, the survey did not indicate any serious sources of pollution presently existing in the municipality. While the biochemical oxygen demand and suspended solids contents of the final effluent from the Camp Borden plant are in excess of the Commission's concentration limits, the effects of the polluting wastes from this plant are not reflected in impairment of the quality of the receiving stream to any significant extent.

The Boyne River and its tributary Spring Creek contained pollution from sources suspected of originating upstream in the Town of Alliston. The Commission recognizes the problems associated with the treatment of industrial wastes and domestic sewage in Alliston and will continue with its efforts to bring about an improvement in the waste treatment facilities serving this municipality.

A serious water pollution problem did occur in July of 1963 when a toxic chemical used for spraying potato crops gained access to the Nottawasaga River. The Commission appreciates the assistance of Mr.J.Keith McRuer, Agricultural Representative, South Simcoe, for his efforts in preventing a recurrence of this type of pollution.

Problems associated with malfunctioning septic tank systems exist in the Police Village of Angus. The close proximity of a number of these systems to private sand point wells has caused some concern as to the quality of the water. There was no evidence found at the time of this survey that surface water pollution resulted from defective septic tank systems. It is understood that consideration is being given to the installation of a sewage works and/or a water works to serve Angus.

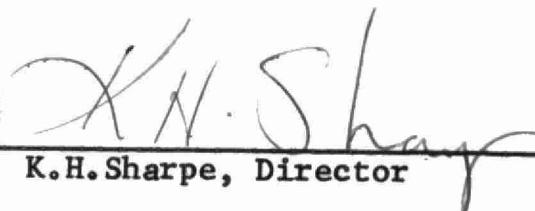
Seepage was noted from the refuse disposal dump located south of Baxter. It is planned to re-assess this site with respect to pollution at a later date.

All of which is respectfully submitted,

District Engineer:


H. Browne

Approved by:


K.H. Sharpe, Director

Prepared by: P.J.Walsh

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TABLE I-1

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED.

<u>SAMPLE POINT NO.</u>	<u>LOCATION</u>	<u>DATE EXAMINED</u>	<u>COLIFORMS/100ML MF</u>	<u>5-DAY BOD</u>	<u>TOTAL</u>	<u>SOLIDS SUSP.</u>	<u>DISS.</u>	<u>TURBIDITY</u>
NOTTAWASAGA RIVER								
N-49.9	NOTTAWASAGA R. AT Hwy. No. 89- ROAD ALLOWANCE BETWEEN TOWNSHIPS OF ESSA AND TECUMSETH	JUNE 5/62	340	1.3	294	--	--	14
NB-53.1	BOYNE R. AT KING ST. (ALLISTON) ROAD ALLOWANCE BETWEEN TOWNSHIPS OF ESSA AND TOSSORONTIO	DEC. 15/61 MAY 15/62	300 50	0.7 1.2	342 266	-- --	-- --	3.1 2.5
NB-52.0	BOYNE R. AT BOYNE ST. N. (ALLISTON) ROAD ALLOWANCE BETWEEN ALLISTON & ESSA	DEC. 15/61 MAY 15/62 JUNE 5/62 APR. 3/63 MAY 22/63	10,000 31,000 262,000 129,000 59,000	3.4 1.8 4.2 2.0 3.6	352 276 298 284 314	-- -- -- -- --	-- -- -- -- --	7.5 2.3 6.5 6.0 2.6
NB-51.2	BOYNE R. AT ROAD ALLOWANCE BETWEEN CONC. 2 & 3 TOWNSHIP OF ESSA	DEC. 15/61 JUNE 5/62 JUNE 26/62	16 262,000 45,000	2.2 5.4 --	352 306 --	-- -- --	-- -- --	5.5 7.0 --
NB-50.7	BOYNE R. - 100 FT. UPSTREAM FROM MOUTH OF SPRING CREEK	JUNE 5/62 APR. 3/63	160,000 167,000	2.1 2.3	298 304	-- --	-- --	5.5 6.5

TABLE I-2

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED.

<u>SAMPLE POINT NO.</u>	<u>LOCATION</u>	<u>DATE EXAMINED</u>	<u>COLIFORMS/100ML MF</u>	<u>5-DAY BOD</u>	<u>TOTAL</u>	<u>SOLIDS SUSP. DISS.</u>	<u>TURBIDITY</u>
SPRING CREEK							
NBS-50.7	SPRING CREEK AT Hwy. No.89 UPSTREAM FROM MOUTH	DEC. 15/61 JUNE 5/62 JUNE 26/62 APR. 3/63	100 1,000 190 190	285 22 -- 3.5	608 430 -- 402	100 54 -- --	508 376 -- 4.5
NB-50.6	BOYNE R.-300 FT. DOWNSTREAM FROM MOUTH OF SPRING CREEK	JUNE 5/62 JUNE 26/62 APR. 3/63	17,000 46,000 152,000	4.4 -- 2.4	316 -- 304	-- -- --	7.5 -- 7.0
NB-50.4	BOYNE R. AT ROAD ALLOWANCE BETWEEN CONC. 3 & 4 (COUNTY ROAD NO.10) TOWNSHIP OF ESSA	DEC. 15/61 JUNE 5/62	16 29,000	2.2 1.8	352 282	-- --	5.5 4.0
NB-49.6	BOYNE R. UPSTREAM FROM JUNCTION WITH NOTTAWASAGA R.	JUNE 5/62	45,000	2.4	282	-- --	4.0
NOTTAWASAGA RIVER							
N-48.8	NOTTAWASAGA RIVER AT ROAD ALLOWANCE BETWEEN CONC.RD. 4 & 5 - N.OF NICOLSTON	JULY 12/61 JUNE 5/62 OCT. 16/62 MAY 22/63	900 1,100 31,000 2,020	1.2 1.6 1.8 2.4	298 292 332 358	-- -- -- --	3.0 10.0 8.5 11.5
N-31.6	NOTTAWASAGA R. AT ROAD ALLOWANCE BETWEEN LOTS 30 & 31 - E. OF ANGUS	JULY 12/61 OCT. 16/62 MAY 22/63	170 700 1,070	1.5 2.2 2.0	292 344 362	-- -- --	5.0 20 20

TABLE I-3

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED.

<u>SAMPLE POINT No.</u>	<u>LOCATION</u>	<u>DATE EXAMINED</u>	<u>COLIFORMS/100ML</u>	<u>5-DAY BOD</u>	<u>SOLIDS</u>			<u>TURBIDITY</u>
			<u>MF</u>	<u>BOD</u>	<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>	
PINE RIVER								
NP-33.9	PINE R. UPSTREAM FROM CAMP BORDEN SEWAGE TREATMENT PLANT OUTFALL SEWER	JULY 12/61 OCT. 16/62 MAY 22/63	320 80 30	0.9 1.4 6.0	252 272 310	-- -- --	-- -- --	2.0 3.5 14
NP-33.8 T	CAMP BORDEN SEWAGE TREATMENT PLANT OUTFALL SEWER	JULY 12/61 OCT. 16/62 MAY 22/63	16,300 9,000 2	68 76 48	460 494 426	52 72 41	408 422 385	-- -- --
NP-33.7	PINE R. DOWNSTREAM FROM CAMP BORDEN SEWAGE TREATMENT PLANT	JULY 12/61 OCT. 16/62 MAY 22/63	290 500 800	2.0 30 2.3	248 306 308	-- -- 35	-- -- 273	2 23 32
NP-32.5 W	30-INCH DIAMETER STORM SEWER- MARGARET ST. POLICE VILLAGE OF ANGUS	MARCH 6/64	NOT SAMPLED					
NP-32.4	PINE R. AT HWY. NO. 90 - ANGUS	JULY 12/61 OCT. 16/62 MAY 22/63	370 94 440	2.4 2.5 2.8	252 278 298	-- -- --	-- -- --	2.0 3.3 13.0
NPT-32.2	PINE RIVER TRIBUTARY AT ELIZABETH & SIMCOE STS. - ANGUS	JULY 12/61 OCT. 16/62 MAY 22/63	189 214 620	0.8 1.2 2.2	280 324 240	-- -- --	-- -- --	1.0 1.1 0.6

TABLE I-4

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED.

<u>SAMPLE POINT No.</u>	<u>LOCATION</u>	<u>DATE EXAMINED</u>	<u>COLIFORMS/100ML</u>	<u>5-DAY BOD</u>	<u>SOLIDS</u>			<u>TURBIDITY</u>
			<u>MF</u>	<u>BOD</u>	<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>	
NP-31.8	PINE R. TRIBUTARY	JUNE 16/60	770	1.6	254	18	236	--
	AT 1ST ROAD WEST OF	JULY 20/60	1070	3.5	288	20	268	--
	AND UPSTREAM FROM	AUG. 24/60	41,000	2.2	266	24	242	--
	CONFLUENCE- N. OF ANGUS	SEPT. 29/60	120	1.6	258	--	--	1.0
		MAY 22/63	700	2.3	302	--	--	21
NP-31.0	PINE R. UPSTREAM	JUNE 16/60	770	1.6	254	18	236	--
	FROM CONFLUENCE WITH	JULY 20/60	1,070	3.5	288	20	268	--
	NOTTAWASAGA R.	AUG. 24/60	20,000	2.2	266	24	242	--
		SEPT. 29/60	120	1.6	258	--	--	1
N-30.9	NOTTAWASAGA R.	JUNE 16/60	<10	2.2	276	20	256	--
	DOWNSTREAM FROM MOUTH	JULY 20/60	710	1.3	306	28	278	--
	OF PINE R.	AUG. 24/60	41,000	0.8	288	26	262	--
		SEPT. 29/60	180	1.6	264	--	--	4



ONTARIO WATER RESOURCES COMMISSION		
TOWNSHIP OF ESSA		
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